SEQUENCE LISTING
<110>   UNO, Yukio
         HIKICHI, Yukiko
         SAGIYA, Yoji
         NAKANISHI, Atsushi

<120>   Human Sodium-Dependent Bile Acid Transporter Proteins

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Pro Trp Gly Ile Ala Val Gly Leu Leu Cys Gln Phe Gly Leu Met Pro
  65                  70                  75                  80
Phe Thr Ala Tyr Leu Leu Ala Ile Ser Phe Ser Leu Lys Pro Val Gln
                  85                  90                  95
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Asn Val Phe Thr Phe Trp Val Asp Gly Asp Met Asp Leu Ser Ile Ser
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                195                     200                     205
Ala Val Ala Gly Val Val Leu Ala Lys Gly Ser Trp Asn Ser Asp Ile
    210                     215                     220
Thr Leu Leu Thr Ile Ser Phe Ile Phe Pro Leu Ile Gly His Val Thr
225                     230                     235                     240
Gly Phe Leu Leu Ala Leu Phe Thr His Gln Ser Trp Gln Arg Cys Arg
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65   70   75   80
Ser Leu Ala Lys Ile Gly Phe His Leu Tyr His Arg Leu Pro Gly Leu
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              100   105   110
Ile Ile Phe Gly Thr Asp His Lys Ser Pro Pro Val Met Asp Ser Ser
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Ile Tyr Phe Leu Tyr Leu Leu Pro Pro Ile Val Leu Glu Gly Gly Tyr
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Leu Tyr Leu Ile Cys Gln Val Lys Ala Phe Gly Leu Gly Asp Val Asn
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Leu Leu Gln Asn Leu Leu Phe Gly Ser Leu Ile Ser Ala Val Asp Pro
      195   200   205
Val Ala Val Leu Ala Val Phe Glu Glu Ala Arg Val Asn Glu Gln Leu
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Tyr Met Met Ile Phe Gly Glu Ala Leu Leu Asn Asp Gly Ile Thr Val
225   230   235   240
Val Leu Tyr Asn Met Leu Ile Ala Phe Thr Lys Met His Lys Phe Glu
          245   250   255
Asp Ile Glu Thr Val Asp Ile Leu Ala Gly Cys Ala Arg Phe Ile Val
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Val Gly Leu Gly Gly Val Leu Phe Gly Ile Val Phe Gly Phe Ile Ser
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Ala Phe Ile Thr Arg Phe Thr Gln Asn Ile Ser Ala Ile Glu Pro Leu
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Tyr Leu Ser Gly Ile Leu Ala Ile Thr Ala Cys Ala Val Thr Met Lys
              325   330   335
Lys Tyr Val Glu Glu Asn Val Ser Gln Thr Ser Tyr Thr Thr Ile Lys
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Tyr Phe Met Lys Met Leu Ser Ser Val Ser Glu Thr Leu Ile Phe Ile
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705                     710                     715                     720
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Leu Gly Gly Val Arg Arg Val Ala Leu Arg Pro Lys Pro Leu Phe His
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Ala Val Asp Glu Glu Gly Glu Ser Gly Gly Glu Ser Glu Gly Lys Ala
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Ile Ser Thr Ala Lys Tyr Ser Val Leu Thr Phe Leu Pro Arg Phe Leu
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Tyr Glu Gln Ile Arg Arg Ala Ala Asn Ala Phe Phe Leu Phe Ile Ala
    50                  55                  60
Leu Leu Gln Gln Ile Pro Asp Val Ser Pro Thr Gly Arg Tyr Thr Thr
65                  70                  75                  80
Leu Val Pro Leu Ile Ile Ile Leu Thr Ile Ala Gly Ile Lys Glu Ile
                85                  90                  95
Val Glu Asp Phe Lys Arg His Lys Ala Asp Asn Ala Val Asn Lys Lys
            100                 105                 110
Lys Thr Ile Val Leu Arg Asn Gly Met Trp His Thr Ile Met Trp Lys
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Glu Val Ala Val Gly Asp Ile Val Lys Val Val Asn Gly Gln Tyr Leu
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Pro Ala Asp Val Val Leu Leu Ser Ser Ser Glu Pro Gln Ala Met Cys
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Tyr Val Glu Thr Ala Asn Leu Asp Gly Glu Thr Asn Leu Lys Ile Arg
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Gln Gly Leu Ser His Thr Ala Asp Met Gln Thr Arg Glu Val Leu Met
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Lys Leu Ser Gly Thr Ile Glu Cys Glu Gly Pro Asn Arg His Leu Tyr
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Gln Asn Ser Thr Lys Ala Pro Leu Lys Arg Ser Asn Val Glu Lys Val
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Thr Asn Val Gln Ile Leu Val Leu Phe Gly Ile Leu Leu Val Met Ala
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Leu Val Ser Ser Ala Gly Ala Leu Tyr Trp Asn Arg Ser His Gly Glu
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Lys Asn Trp Tyr Ile Lys Lys Met Asp Thr Thr Ser Asp Asn Phe Gly
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Tyr Asn Leu Leu Thr Phe Ile Ile Leu Tyr Asn Asn Leu Ile Pro Ile
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Ser Leu Leu Val Thr Leu Glu Val Val Lys Tyr Thr Gln Ala Leu Phe
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Ile Asn Trp Asp Thr Asp Met Tyr Tyr Ile Gly Asn Asp Thr Pro Ala
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Met Ala Arg Thr Ser Asn Leu Asn Glu Glu Leu Gly Gln Val Lys Tyr
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Lys Lys Cys Ser Ile Ala Gly Val Thr Tyr Gly His Phe Pro Glu Leu
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Lys Leu Gly Phe Val Phe Thr Ala Arg Thr Pro Phe Ser Val Ile Ile
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Glu Tyr Phe Ala Thr Glu Gly Leu Arg Thr Leu Cys Val Ala Tyr Ala
            580                 585                 590
Asp Leu Ser Glu Asn Glu Tyr Glu Glu Trp Leu Lys Val Tyr Gln Glu
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Ala Ser Thr Ile Leu Lys Asp Arg Ala Gln Arg Leu Glu Glu Cys Tyr
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Glu Ile Ile Glu Lys Asn Leu Leu Leu Leu Gly Ala Thr Ala Ile Glu
625                 630                 635                 640
Asp Arg Leu Gln Ala Gly Val Pro Glu Thr Ile Ala Thr Leu Leu Lys
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Ala Glu Ile Lys Ile Trp Val Leu Thr Gly Asp Lys Gln Glu Thr Ala
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Ile Asn Ile Gly Tyr Ser Cys Arg Leu Val Ser Gln Asn Met Ala Leu
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Ile Leu Leu Lys Glu Asp Ser Leu Asp Ala Thr Arg Ala Ala Ile Thr
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Gln His Cys Thr Asp Leu Gly Asn Leu Leu Gly Lys Glu Asn Asp Val
705                 710                 715                 720
Ala Leu Ile Ile Asp Gly His Thr Leu Lys Tyr Ala Leu Ser Phe Glu
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Val Arg Arg Ser Phe Leu Asp Leu Ala Leu Ser Cys Lys Ala Val Ile
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Cys Cys Arg Val Ser Pro Leu Gln Lys Ser Glu Ile Val Asp Val Val
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Lys Lys Arg Val Lys Ala Ile Thr Leu Ala Ile Gly Asp Gly Ala Asn
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Asn Arg Val Thr Lys Cys Ile Leu Tyr Cys Phe Tyr Lys Asn Val Val
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Leu Tyr Ile Ile Glu Leu Trp Phe Ala Phe Val Asn Gly Phe Ser Gly
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Gln Ile Leu Phe Glu Arg Trp Cys Ile Gly Leu Tyr Asn Val Ile Phe
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Thr Ala Leu Pro Pro Phe Thr Leu Gly Ile Phe Glu Arg Ser Cys Thr
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Gln Glu Ser Met Leu Arg Phe Pro Gln Leu Tyr Lys Ile Thr Gln Asn
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Gly Glu Gly Phe Asn Thr Lys Val Phe Trp Gly His Cys Ile Asn Ala
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Leu Val His Ser Leu Ile Leu Phe Trp Phe Pro Met Lys Ala Leu Glu
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Page 15

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Trp Pro Thr Ile Pro Ile Ala Pro Asp Met Arg Gly Gln Ala Thr Met
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Phe Ala Glu Glu Asn Asp Ile Leu Gly Arg Phe Ile Asn Ala Glu Tyr
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Thr Glu Glu Ala Tyr Glu Gly Gln Thr Ala Leu Asn Ile Ala Ile Glu
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Q101072 US-SEQ.txt

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gcgtacggac ccgtgtcatc ctccctctac gacctcacca acgtggacac caccacggac   1200
aactcagtgc tggaaatcac tgtctacaac accaacatcg acaaccggca tgagatgctg   1260
accctggagc cgctgcacac gctgctgcat atgaagtgga agaagtttgc caagcacatg   1320
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taccgcccc gggaggagga ggccatcccg cacccttgg ccctgacgca caagatgggg   1440
tggctgcagc tcctagggag gatgtttgtg ctcatctggg ccatgtgcat ctctgtgaaa   1500
gagggcattg ccatcttcct gctgagaccc tcggatctgc agtccatcct ctcggatgcc   1560
tggttccact ttgtcttttt tatccaagct gtgcttgtga tactgtctgt cttcttgtac   1620
ttgtttgcct acaaagagta cctcgcctgc ctcgtgctgg ccatggccct gggctgggcg   1680
aacatgctct actatacgcg gggtttccag tccatgggca tgtacagcgt catgatccag   1740
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tttggagtag ccttggcctc gctgatcgag aagtgtccca aagacaacaa ggactgcagc   1860
tcctacggca gcttcagcga cgcagtgctg gaactcttca gctcaccat aggcctgggt   1920
gacctgaaca tccagcagaa ctccaagtat cccattctct ttctgttcct gctcatcacc   1980
tatgtcatcc tcacctttgt tctcctcctc aacatgctca ttgctctgat gggcgagact   2040
gtggagaacg tctccaagga gagcgaacgc atctggcgcc tgcagagagc caggaccatc   2100
ttggagtttg agaaaatgtt accagaatgg ctgaggagca gattccggat gggagagctg   2160
```

```
tgcaaagtgg ccgaggatga tttccgactg tgtttgcgga tcaatgaggt gaagtggact   2220
gaatggaaga cgcacgtctc cttccttaac gaagacccgg ggcctgtaag acgaacagca   2280
gatttcaaca aaatccaaga ttcttccagg aacaacagca aaaccactct caatgcattt   2340
gaagaagtcg aggaattccc ggaaacctcg gtg                                 2373
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<210> 104
<211> 373
<212> PRT
<213> Mouse

<400> 104

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Glu Glu Asp Pro Pro Val Gly Met Glu Gly His Ala Asn Leu Lys Leu
            20                  25                  30
Leu Phe Thr Val Leu Ser Ala Val Met Val Gly Leu Val Met Phe Ser
        35                  40                  45
Phe Gly Cys Ser Val Glu Ser Gln Lys Leu Trp Leu His Leu Arg Arg
    50                  55                  60
Pro Trp Gly Ile Ala Val Gly Leu Leu Ser Gln Phe Gly Leu Met Pro
65                  70                  75                  80
Leu Thr Ala Tyr Leu Leu Ala Ile Gly Phe Gly Leu Lys Pro Phe Gln
                85                  90                  95
Ala Ile Ala Val Leu Met Met Gly Ser Cys Pro Gly Gly Thr Ile Ser
            100                 105                 110
Asn Val Leu Thr Phe Trp Val Asp Gly Asp Met Asp Leu Ser Ile Ser
        115                 120                 125
Met Thr Thr Cys Ser Thr Val Ala Ala Leu Gly Met Met Pro Leu Cys
    130                 135                 140
Leu Tyr Ile Tyr Thr Arg Ser Trp Thr Leu Thr Gln Asn Leu Val Ile
145                 150                 155                 160
Pro Tyr Gln Ser Ile Gly Ile Thr Leu Val Ser Leu Val Val Pro Val
                165                 170                 175
Ala Ser Gly Val Tyr Val Asn Tyr Arg Trp Pro Lys Gln Ala Thr Val
            180                 185                 190
Ile Leu Lys Val Gly Ala Ile Leu Gly Gly Met Leu Leu Leu Val Val
        195                 200                 205
Ala Val Thr Gly Met Val Leu Ala Lys Gly Trp Asn Thr Asp Val Thr
    210                 215                 220
Leu Leu Val Ile Ser Cys Ile Phe Pro Leu Val Gly His Val Thr Gly
225                 230                 235                 240
Phe Leu Leu Ala Phe Leu Thr His Gln Ser Trp Gln Arg Cys Arg Thr
                245                 250                 255
Ile Ser Ile Glu Thr Gly Ala Gln Asn Ile Gln Leu Cys Ile Ala Met
            260                 265                 270
Leu Gln Leu Ser Phe Ser Ala Glu Tyr Leu Val Gln Leu Leu Asn Phe
        275                 280                 285
Ala Leu Ala Tyr Gly Leu Phe Gln Val Leu His Gly Leu Leu Ile Val
    290                 295                 300
Ala Ala Tyr Gln Ala Tyr Lys Arg Arg Gln Lys Ser Lys Cys Arg Arg
305                 310                 315                 320
Gln His Pro Asp Cys Pro Asp Val Cys Tyr Glu Lys Gln Pro Arg Glu
                325                 330                 335
Thr Ser Ala Phe Leu Asp Lys Gly Asp Glu Ala Ala Val Thr Leu Gly
            340                 345                 350
Pro Val Gln Pro Glu Gln His His Arg Ala Ala Glu Leu Thr Ser His
        355                 360                 365
Ile Pro Ser Cys Glu
        370
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<210> 105
<211> 1119
<212> DNA

<213> Mouse

<400> 105
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atggtgggtt tggtcatgtt ctcttttgga tgttctgtgg agagtcagaa gctctggttg    180
cacctcagaa gaccctgggg catcgcagtg ggcctgcttt cccagtttgg acttatgcct    240
ctgacagctt atctgttagc cattggcttc ggtctgaaac cattccaagc tattgctgtc    300
ctcatgatgg ggagctgccc tgggggcacc atctctaatg ttctcacctt ctgggttgat    360
ggagatatgg atctcagcat cagtatgaca acctgttcca cagtggccgc cctgggaatg    420
atgcctctct gcctctacat ctacacccgg tcctggactc tgacacagaa cctcgtcatt    480
ccgtatcaga gcataggaat tacccttgtg tccctggtgg ttcctgtggc ttctggcgtc    540
tatgtgaatt ataggtggcc aaagcaagca acggtcattc tcaaggtcgg agccattctg    600
ggtggcatgc tcctcctggt ggtggcagtt actggcatgg tcctggcaaa aggctggaac    660
acagacgtca ctcttctggt catcagctgc attttcccct tggtcggcca tgtcacaggc    720
ttcctgctgg cattcctcac ccaccaatct tggcaaaggt gcaggaccat ttccatagag    780
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ctgctcattg tcgcagcata tcaggcatac aagaggaggc agaagagtaa atgcaggaga    960
cagcacccgg attgcccaga cgtctgctac gagaagcagc ccagagagac cagtgctttc   1020
ttggataaag gggatgaggc tgccgtaact ctggggccag tgcagccaga gcagcaccac   1080
agggctgctg agctgactag ccacattcct tcatgtgaa                          1119
```

<210> 106
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 106
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gacctgccca gtgcttgcta ctca                                             24
```

<210> 107
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 107
```
tcttcactgg ccacggagga ggat                                             24
```

<210> 108
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 108
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ctattgctgt cctcatgatg g                                                21
```

<210> 109
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 109
catgctgcag ctgtccttct c   21

<210> 110
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 110
ccatcatgag gacagcaata g   21

<210> 111
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 111
gagaaggaca gctgcagcat g   21

<210> 112
<211> 1237
<212> DNA
<213> Mouse

<400> 112
gacctgccca gtgcttgcta ctcatgttcc tttgtgttcc tgtgttctaa ttcatgagag   60
gagatgagca cagactgtgc gggcaactcc acctgccctg tcaacagtac ggaggaagac   120
ccgcccgtgg gaatggaggg ccatgcgaat ctaaagctgc tttttacagt gctctcggct   180
gtgatggtgg gtttggtcat gttctctttt ggatgttctg tggagagtca gaagctctgg   240
ttgcacctca gaagaccctg gggcatcgca gtgggcctgc tttcccagtt tggacttatg   300
cctctgacag cttatctgtt agccattggc ttcggtctga aaccattcca agctattgct   360
gtcctcatga tggggagctg ccctgggggc accatctcta atgttctcac cttctgggtt   420
gatggagata tggatctcag catcagtatg acaacctgtt ccacagtggc cgccctggga   480
atgatgcctc tctgcctcta catctacacc cggtcctgga ctctgacaca gaacctcgtc   540
attccgtatc agagcatagg aattaccctt gtgtccctgg tggttcctgt ggcttctggc   600
gtctatgtga attataggtg gccaaagcaa gcaacggtca ttctcaaggt cggagccatt   660
ctgggtggca tgctcctcct ggtggtggca gttactggca tggtcctggc aaaaggctgg   720
aacacagacg tcactcttct ggtcatcagc tgcattttcc ccttggtcgg ccatgtcaca   780
ggcttcctgc tggcattcct cacccaccaa tcttggcaaa ggtgcaggac catttccata   840
gagactggcg ctcagaacat ccagctgtgc atcgccatgc tgcagctgtc cttctctgct   900
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ttcttggata aaggggatga ggctgccgta actctggggc cagtgcagcc agagcagcac   1140
cacagggctg ctgagctgac tagccacatt ccttcatgtg aatagtggga ggcacggacc   1200
agcttggccc tccatcctcc tccgtggcca gtgaaga   1237

<210> 113
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 113

cttctggcgt ctatgtgaat tatagg   26

<210> 114
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 114
gagcatgcca cccagaatg   19

<210> 115
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 115
caaagcaagc aacggtcatt ctcaaggtc   29

<210> 116
<211> 1046
<212> DNA
<213> Rat

<220>
<221> misc_feature
<222> (811)..(812)
<223> a, c, g or t

<400> 116
gaagacccac ccgtgggaat ggagggacag gggagcctga agcttgtttt cacagtcctg   60
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ctctggctgc acctcagaag accctggggc atcgcagtgg gcctgctttg ccagtttggg   180
ctcatgcctc tgacagctta tctgctagcc attggcttcg gtctgaaacc attccaagct   240
attgccgtcc tcatcatggg gagctgccct gggggcaccg tctctaatgt cctcaccttc   300
tgggttgatg gagatatgga cctcagcatc agcatgacga cctgctccac agtggctgct   360
ctgggaatga tgcccctctg cctctacgtc tacacccggt cctggactct tccacagagc   420
ctcaccatcc cgtaccagag cataggaatt acccttgtgt ccctggttgt tcctgtggcc   480
tccggcatct atgtgaatta taggtggcca aagcaagcaa cattcattct caaggtcggg   540
gctgctgttg gcggcatgct cctcctggtg gtggcagtta ccggcgtggt cctggcaaag   600
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gtcatgggct tcctgctggc gttcctcacc caccagtctt ggcaaaggtg caggacgatt   720
tccatagaga ccggagcaca gaacatccag ctgtgcattg ccatgatgca gctgtccttc   780
tctgctgagt acctggtcca gctgttaaac nncgccctgg cctacggact cttccaagtg   840
ctgcacgggc tgctcattgt cgcagcatat caggcataca agaggaggca gaagagtcaa   900
tacaggagac agcacccgga gtgccaagac atcagctctg agaagcagcc cagagagacc   960
agtgccttct tggataaagg ggctgaggct gctgtaactc tggggctaga gcagcaccac   1020
aggaccgctg aactgaccag tcacgt   1046

<210> 117
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 117

atgagcgcag actgcgaggg caa   23

<210> 118
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 118
tcccactatt cacatgaagg aacg   24

<210> 119
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 119
tccggcatct atgtgaatta tagg   24

<210> 120
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 120
taactgccac caccaggagg   20

<210> 121
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 121
agcaagcaac attcattctc aaggtcgg   28

<210> 122
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 122
taggaagctt gtcgacatga gagccaattg ttccag   36

<210> 123
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<223> Primer

<400> 123
aatgtctaga actagtctat tcacatgaag tgatgtgg   38

<210> 124
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 124
tagaaggcac agtcgagg   18

<210> 125
<211> 317
<212> DNA
<213> Mouse

<400> 125
ccggaggaac ctgccaaaat caagcatcgt ttctttgtat aagaagctgg agatgaaaca   60
ggccattgag atggtagaga ctgggatact gagctctgtg gcttctccca caccctatca   120
gtctgagagg atacagggaa tcaagcggct ttctcctgaa gacgtggagt ccatgcggga   180
cattctgaca agaagcatgt accaagttcg acaaagaacc ctatcctaca acaaatacaa   240
cctcaaaccc caaacaagtg agaagcaagc caaagagatt ctgatccgtc gccagaacac   300
cttgagggag agcatgc   317

<210> 126
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 126
ccggaggaac ctgccaaaat caa   23

<210> 127
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 127
gcatgctctc cctcaaggtg ttctgg   26

<210> 128
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 128
gatgaaacag gccattgaga tg   22

<210> 129

<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 129
gattccctgt atcctctcag actga   25

<210> 130
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 130
ctgggatact gagctctgtg gctt   24

<210> 131
<211> 363
<212> DNA
<213> Rat

<400> 131
tcgtgggatg cgggggagta tttttcggca tcatttttgg attcatttcc gcatttatca   60
cacgtttcac tcagaacatc tctgcgatcg agcctctcat cgtcttcatg ttcagctatc   120
tgtcttactt agcagccgag acgctttatc tctccggaat cctggccatc acagcttgtg   180
cagtgacaat gaaaaagtac gtggaagaga acgtgtccca gacgtcgtac acgaccatca   240
agtacttcat gaagatgctg agcagcgtga gcgagaccct catcttcatc ttcatgggcg   300
tgtccaccgt tgggaagaac catgagtgga actgggcttt cgtctgcttc accctggcct   360
tct   363

<210> 132
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 132
tcgtgggatg cgggggagta ttt   23

<210> 133
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 133
agaaggccag ggtgaagcag acga   24

<210> 134
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Primer

<400> 134
agcagccgag acgctttatc t   21

<210> 135
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 135
tctcttccac gtactttttc attgtc   26

<210> 136
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 136
aatcctggcc atcacagctt gtgca   25

<210> 137
<211> 35
<212> DNA
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<220>
<223> Primer

<400> 137
gacaagctta tcgatatggc tctgcagatg ttcgt   35

<210> 138
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 138
gactctagaa ctagtctatt tttttggag caaaggact   39

<210> 139
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 139
ctcctgccac ccatcgttct   20

<210> 140
<211> 20
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<213> Artificial Sequence

<220>
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<400> 140
gctggatgtg cccgattcat   20

<210> 141
<211> 20
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<213> Artificial Sequence

<220>
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<400> 141
catcagcgta tttgctctct   20

<210> 142
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 142
tccccaaaga tcatcatgta   20

<210> 143
<211> 680
<212> DNA
<213> Mouse

<400> 143
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tcaatgcctt ggttcattcc ctcatcctct tctgggttcc catgaaagcg ctggagcatg   360
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caaccatctg gccgaccatc cccattgctc ctgacatgaa agggcaggca actatggtcc   600
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acgtggcgtg gagagcggcc   680

<210> 144
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 144
gccatcgcac agttttccta cct   23

<210> 145
<211> 24
<212> DNA

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<213> Artificial Sequence

<220>
<223> Primer

<400> 145
catcctcttt ccgttactgt ctcg                                             24

<210> 146
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 146
aaccatctgg ccgaccatc                                                   19

<210> 147
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 147
acgcagagct caggaccata g                                                21

<210> 148
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 148
tgcctgccct ttcatgtcag gagc                                             24

<210> 149
<211> 771
<212> DNA
<213> Rat

<400> 149
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ttctgggcag attttatttg agcgctggtg catcggcttg tacaatgtga tcttcacagc     180
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gtttccacag ctctacaaaa tcactcagaa cgccgaaggt ttcaacacga aggttttctg     300
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tggtgtctat tcaaccttct ggccgaccat ccccatcgct cctgacatga aagggcaggc     600
aactatggtc ctgagttctg cccacttctg gttgggtttg ctcctggttc ccactgcgtg     660
tttgatcgag gatgtggcgt ggagagcggc caaacacacc tgcaaaaaga cactgtctgg     720
aggaggttca ggagctggag accaagtccc gagtgtatgg gcaaagcgat g              771

<210> 150
<211> 21
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<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 150
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<210> 151
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 151
accagaagtg ggcagaactc a   21

<210> 152
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 152
catagttgcc tgccctttca tgtcagga   28

<210> 153
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 153
ttggatccgt cgacatgtcc cgggccacgt ctgttgg   37

<210> 154
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 154
ccgcggccgc actagtttat ttcttcctgg atttcttttt ggt   43

<210> 155
<211> 1064
<212> DNA
<213> Mouse

<400> 155
acagcctgag attgtgcagc tgctgatgga gaatgagcag acagacatcg cttcccagga   60
ttcccgggga aacaacatcc tgcacgcgct ggtgacggtg gctgaggact tcaagactca   120
gaatgacttc gttaagcgca tgtatgacat gatcctgctg aggagtggca actgggagct   180
ggagaccatg cgcaacaacg atgggctcac gccactgcag ctggctgcca agatggggcaa   240

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ggctgagatc ctgaagtaca tcctcagccg cgagatcaag gagaagcctc tccggagctt    300
gtccaggaag ttcacggact gggcgtatgg gcctgtgtca tcctcactct atgacctcac    360
caatgtagac acaacgacgg ataactctgt gctggaaatc atcgtctaca acaccaacat    420
tgataaccga catgagatgc tgacctgcc gcctctgcat acgctgctac acacgaaatg    480
gaagaaattt gccaagtaca tgttcttctt gtccttctgc ttctatttct tctacaacat    540
caccctgacc cttgtctctt actaccgtcc tcgggaagat gaggatctcc cacacccctt    600
ggccctgaca cacaaaatga gttggcttca gctcctaggg aggatgtttg tcctcatctg    660
ggccacatgc atctctgtga aagaaggcat tgccattttc ctgctgagac cctccgatct    720
tcagtccatc ctgtcagatg cctggtttca ctttgtcttt tttgtccaag ctgtacttgt    780
gatactgtct gtattcttgt acttgtttgc ctacaaagaa tacctcgcct gcctcgtgct    840
ggccatggcc ctgggctggg cgaacatgct ctactacacg agaggcttcc agtctatggg    900
catgtacagc gtcatgatcc agaaggtcat tttgcatgat gtcctcaagt tcttgtttgt    960
ttacatcctg ttcttacttg gatttggagt agcgctggcc tcactgattg agaagtgctc   1020
caaggacaaa aaggactgca gttcctatgg cagcttcagc gaca                     1064
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<213> Artificial Sequence

<220>
<223> Primer

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gcgtgtacta accagcctga gattgtg   27

<210> 157
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<213> Artificial Sequence

<220>
<223> Primer

<400> 157
gtcgctgaag ctgccatagg aactg   25

<210> 158
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<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 158
ctgagaccct ccgatcttca gt   22

<210> 159
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 159
ggcaggcgag gtattctttg ta   22

<210> 160
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<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 160
cctgtcagat gcctggtttc actttgtctt   30

<210> 161
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 161
cggggtaccg tcgacatgaa agcccacccc aagg   34

<210> 162
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 162
atttgcggcc gcactagtct acaccgaggt ttccggg   37

<210> 163
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 163
taatacgact cactataggg   20

<210> 164
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 164
gacacgggga agacctgcct gatg   24

<210> 165
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 165
gtggcaactg ggagctggag acc   23

<210> 166

```
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 166
gggccatgtg catctctgtg aaag                                          24

<210> 167
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 167
ctgatgggcg agactgtgga g                                             21

<210> 168
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 168
tagaaggcac agtcgagg                                                 18

<210> 169
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 169
ctccacagtc tcgcccatca g                                             21

<210> 170
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 170
ctttcacaga gatgcacatg gccc                                          24

<210> 171
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 171
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ggtctccagc tcccagttgc cac   23

<210> 172
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 172
catcaggcag gtcttccccg tgtc   24

<210>   173
<211>   348
<212>   PRT
<213>   Human

<400>   173

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Met Asn Asp Pro Asn Ser Cys Val Asp Asn Ala Thr Val Cys Ser Gly
1               5                   10                  15
Ala Ser Cys Val Val Pro Glu Ser Asn Phe Asn Asn Ile Leu Ser Val
            20                  25                  30
Val Leu Ser Thr Val Leu Thr Ile Leu Leu Ala Leu Val Met Phe Ser
        35                  40                  45
Met Gly Cys Asn Val Glu Ile Lys Lys Phe Leu Gly His Ile Lys Arg
    50                  55                  60
Pro Trp Gly Ile Cys Val Gly Phe Leu Cys Gln Phe Gly Ile Met Pro
65                  70                  75                  80
Leu Thr Gly Phe Ile Leu Ser Val Ala Phe Asp Ile Leu Pro Leu Gln
                85                  90                  95
Ala Val Val Val Leu Ile Ile Gly Cys Cys Pro Gly Gly Thr Ala Ser
            100                 105                 110
Asn Ile Leu Ala Tyr Trp Val Asp Gly Asp Met Asp Leu Ser Val Ser
        115                 120                 125
Met Thr Thr Cys Ser Thr Leu Leu Ala Leu Gly Met Met Pro Leu Cys
    130                 135                 140
Leu Leu Ile Tyr Thr Lys Met Trp Val Asp Ser Gly Ser Ile Val Ile
145                 150                 155                 160
Pro Tyr Asp Asn Ile Gly Thr Ser Leu Val Ala Leu Val Val Pro Val
                165                 170                 175
Ser Ile Gly Met Phe Val Asn His Lys Trp Pro Gln Lys Ala Lys Ile
            180                 185                 190
Ile Leu Lys Ile Gly Ser Ile Ala Gly Ala Ile Leu Ile Val Leu Ile
        195                 200                 205
Ala Val Val Gly Gly Ile Leu Tyr Gln Ser Ala Trp Ile Ile Ala Pro
    210                 215                 220
Lys Leu Trp Ile Ile Gly Thr Ile Phe Pro Val Ala Gly Tyr Ser Leu
225                 230                 235                 240
Gly Phe Leu Leu Ala Arg Ile Ala Gly Leu Pro Trp Tyr Arg Cys Arg
                245                 250                 255
Thr Val Ala Phe Glu Thr Gly Met Gln Asn Thr Gln Leu Cys Ser Thr
            260                 265                 270
Ile Val Gln Leu Ser Phe Thr Pro Glu Glu Leu Asn Val Val Phe Thr
        275                 280                 285
Phe Pro Leu Ile Tyr Ser Ile Phe Gln Leu Ala Phe Ala Ala Ile Phe
    290                 295                 300
Leu Gly Phe Tyr Val Ala Tyr Lys Lys Cys His Gly Lys Asn Lys Ala
305                 310                 315                 320
Glu Ile Pro Glu Ser Lys Glu Asn Gly Thr Glu Pro Glu Ser Ser Phe
                325                 330                 335
Tyr Lys Ala Asn Gly Gly Phe Gln Pro Asp Glu Lys
```

<210>   174
<211>   717
<212>   PRT
<213>   Rat

<400>   174

```
Met Gly Pro Ala Met Leu Arg Ala Phe Ser Ser Trp Lys Trp Leu Leu
1               5                   10                  15
Leu Leu Met Val Leu Thr Cys Leu Glu Ala Ser Ser Tyr Val Asn Glu
            20                  25                  30
Ser Ser Ser Pro Thr Gly Gln Gln Thr Pro Asp Ala Arg Phe Ala Ala
        35                  40                  45
Ser Ser Ser Asp Pro Asp Glu Arg Ile Ser Val Phe Glu Leu Asp Tyr
    50                  55                  60
Asp Tyr Val Gln Ile Pro Tyr Glu Val Thr Leu Trp Ile Leu Leu Ala
65                  70                  75                  80
Ser Leu Ala Lys Ile Gly Phe His Leu Tyr His Arg Leu Pro His Leu
                85                  90                  95
Met Pro Glu Ser Cys Leu Leu Ile Ile Val Gly Ala Leu Val Gly Ser
            100                 105                 110
Ile Ile Phe Gly Thr His His Lys Ser Pro Pro Val Met Asp Ser Ser
        115                 120                 125
Ile Tyr Phe Leu Tyr Leu Leu Pro Pro Ile Val Leu Glu Ser Gly Tyr
    130                 135                 140
Phe Met Pro Thr Arg Pro Phe Phe Glu Asn Ile Gly Ser Ile Leu Trp
145                 150                 155                 160
Trp Ala Gly Leu Gly Ala Leu Ile Asn Ala Phe Gly Ile Gly Leu Ser
                165                 170                 175
Leu Tyr Phe Ile Cys Gln Ile Lys Ala Phe Gly Leu Gly Asp Ile Asn
            180                 185                 190
Leu Leu Gln Asn Leu Leu Phe Gly Ser Leu Ile Ser Ala Val Asp Pro
        195                 200                 205
Val Ala Val Leu Ala Val Phe Glu Glu Ala Arg Val Asn Glu Gln Leu
    210                 215                 220
Tyr Met Met Ile Phe Gly Glu Ala Leu Leu Asn Asp Gly Ile Ser Val
225                 230                 235                 240
Val Leu Tyr Asn Ile Leu Ile Ala Phe Thr Lys Met His Lys Phe Glu
                245                 250                 255
Asp Ile Glu Ala Val Asp Ile Leu Ala Gly Cys Ala Arg Phe Val Ile
            260                 265                 270
Val Gly Cys Gly Gly Val Phe Phe Gly Ile Ile Phe Gly Phe Ile Ser
        275                 280                 285
Ala Phe Ile Thr Arg Phe Thr Gln Asn Ile Ser Ala Ile Glu Pro Leu
    290                 295                 300
Ile Val Phe Met Phe Ser Tyr Leu Ser Tyr Leu Ala Ala Glu Thr Leu
305                 310                 315                 320
Tyr Leu Ser Gly Ile Leu Ala Ile Thr Ala Cys Ala Val Thr Met Lys
                325                 330                 335
Lys Tyr Val Glu Glu Asn Val Ser Gln Thr Ser Tyr Thr Thr Ile Lys
            340                 345                 350
Tyr Phe Met Lys Met Leu Ser Ser Val Ser Glu Thr Leu Ile Phe Ile
        355                 360                 365
Phe Met Gly Val Ser Thr Val Gly Lys Asn His Glu Trp Asn Trp Ala
    370                 375                 380
Phe Val Cys Phe Thr Leu Ala Phe Cys Gln Ile Trp Arg Ala Ile Ser
385                 390                 395                 400
Val Phe Thr Leu Phe Tyr Val Ser Asn Gln Phe Arg Thr Phe Pro Phe
                405                 410                 415
Ser Ile Lys Asp Gln Leu Ile Ile Phe Tyr Ser Gly Val Arg Gly Ala
            420                 425                 430
```

```
Gly Ser Phe Ser Leu Ala Phe Leu Leu Pro Leu Thr Leu Phe Pro Arg
    435                     440                 445
Lys Lys Leu Phe Val Thr Ala Thr Leu Val Val Thr Tyr Phe Thr Val
    450                     455                 460
Phe Phe Gln Gly Ile Thr Ile Gly Pro Leu Val Arg Tyr Leu Asp Val
465                 470                 475                     480
Arg Lys Thr Asn Lys Lys Glu Ser Ile Asn Glu Glu Leu His Ile Arg
            485                 490                     495
Leu Met Asp His Leu Lys Ala Gly Ile Glu Asp Val Cys Gly Gln Trp
            500                 505                     510
Ser His Tyr Gln Val Arg Asp Lys Phe Lys Lys Phe Asp His Arg Tyr
        515                 520                     525
Leu Arg Lys Ile Leu Ile Arg Arg Asn Gln Pro Lys Ser Ser Ile Val
    530                     535                 540
Ser Leu Tyr Lys Lys Leu Glu Met Lys Gln Ala Ile Glu Met Ala Glu
545                 550                     555                 560
Thr Gly Leu Leu Ser Ser Val Ala Ser Pro Thr Pro Tyr Gln Ser Glu
                565                 570                     575
Arg Ile Gln Gly Ile Lys Arg Leu Ser Pro Glu Asp Val Glu Ser Met
            580                 585                     590
Arg Asp Ile Leu Thr Arg Asn Met Tyr Gln Val Arg Gln Arg Thr Leu
        595                 600                     605
Ser Tyr Asn Lys Tyr Asn Leu Lys Pro Gln Thr Ser Glu Lys Gln Ala
    610                     615                 620
Lys Glu Ile Leu Ile Arg Arg Gln Asn Thr Leu Arg Glu Ser Leu Arg
625                 630                     635                 640
Lys Gly Gln Ser Leu Pro Trp Val Lys Pro Ala Gly Thr Lys Asn Phe
                645                 650                     655
Arg Tyr Leu Ser Phe Pro Tyr Ser Asn Pro Gln Pro Ala Arg Arg Gly
                660                 665                     670
Ala Arg Ala Ala Glu Ser Thr Gly Asn Pro Cys Cys Trp Leu Leu His
            675                 680                     685
Phe Leu Leu Cys Arg Ala Met Val Glu Lys Ile Trp Gly Pro Gly Gly
    690                     695                 700
Gln Glu Thr Gln Pro Arg Leu Leu Cys Arg Asn Leu Asn
705                 710                 715
```

```
<210>    175
<211>    812
<212>    PRT
<213>    Human

<400>    175
```

```
Met Glu Pro Leu Gly Asn Trp Arg Ser Leu Arg Ala Pro Leu Pro Pro
1               5                   10                  15
Met Leu Leu Leu Leu Leu Gln Val Ala Gly Pro Val Gly Ala Leu
            20                  25                  30
Ala Glu Thr Leu Leu Asn Ala Pro Arg Ala Met Gly Thr Ser Ser Ser
        35                  40                  45
Pro Pro Ser Pro Ala Ser Val Val Ala Pro Gly Thr Thr Leu Phe Glu
    50                  55                  60
Glu Ser Arg Leu Pro Val Phe Thr Leu Asp Tyr Pro His Val Gln Ile
65              70                  75                      80
Pro Phe Glu Ile Thr Leu Trp Ile Leu Leu Ala Ser Leu Ala Lys Ile
            85                  90                  95
Gly Phe His Leu Tyr His Lys Leu Pro Thr Ile Val Pro Glu Ser Cys
            100                 105                 110
Leu Leu Ile Met Val Gly Leu Leu Leu Gly Gly Ile Ile Phe Gly Val
    115                     120                 125
Asp Glu Lys Ser Pro Pro Ala Met Lys Thr Asp Val Phe Phe Leu Tyr
    130                     135                 140
Leu Leu Pro Pro Ile Val Leu Asp Ala Gly Tyr Phe Met Pro Thr Arg
```

Page 50

```
145                   150                        155                        160
Pro Phe Phe Glu Asn Ile Gly Thr Ile Phe Trp Tyr Ala Val Val Gly
                    165                   170                   175
Thr Leu Trp Asn Ser Ile Gly Ile Gly Val Ser Leu Phe Gly Ile Cys
                180                   185                   190
Gln Ile Glu Ala Phe Gly Leu Ser Asp Ile Thr Leu Leu Gln Asn Leu
            195                   200                   205
Leu Phe Gly Ser Leu Ile Ser Ala Val Asp Pro Val Ala Val Leu Ala
        210                   215                   220
Val Phe Glu Asn Ile His Val Asn Glu Gln Leu Tyr Ile Leu Val Phe
225                   230                   235                   240
Gly Glu Ser Leu Leu Asn Asp Ala Val Thr Val Val Leu Tyr Asn Leu
                245                   250                   255
Phe Lys Ser Phe Cys Gln Met Lys Thr Ile Glu Thr Ile Asp Val Phe
            260                   265                   270
Ala Gly Ile Ala Asn Phe Phe Val Val Gly Ile Gly Gly Val Leu Ile
            275                   280                   285
Gly Ile Phe Leu Gly Phe Ile Ala Ala Phe Thr Thr Arg Phe Thr His
        290                   295                   300
Asn Ile Arg Val Ile Glu Pro Leu Phe Val Phe Leu Tyr Ser Tyr Leu
305                   310                   315                   320
Ser Tyr Ile Thr Ala Glu Met Phe His Leu Ser Gly Ile Met Ala Ile
                325                   330                   335
Thr Ala Cys Ala Met Thr Met Asn Lys Tyr Val Glu Glu Asn Val Ser
            340                   345                   350
Gln Lys Ser Tyr Thr Thr Ile Lys Tyr Phe Met Lys Met Leu Ser Ser
        355                   360                   365
Val Ser Glu Thr Leu Ile Phe Ile Phe Met Gly Val Ser Thr Val Gly
        370                   375                   380
Lys Asn His Glu Trp Asn Trp Ala Phe Val Cys Phe Thr Leu Ala Phe
385                   390                   395                   400
Cys Leu Met Trp Arg Ala Leu Gly Val Phe Val Leu Thr Gln Val Ile
                405                   410                   415
Asn Arg Phe Arg Thr Ile Pro Leu Thr Phe Lys Asp Gln Phe Ile Ile
            420                   425                   430
Ala Tyr Gly Gly Leu Arg Gly Ala Ile Cys Phe Ala Leu Val Phe Leu
        435                   440                   445
Leu Pro Ala Ala Val Phe Pro Arg Lys Lys Leu Phe Ile Thr Ala Ala
        450                   455                   460
Ile Val Val Ile Phe Phe Thr Val Phe Ile Leu Gly Ile Thr Ile Arg
465                   470                   475                   480
Pro Leu Val Glu Phe Leu Asp Val Lys Arg Ser Asn Lys Lys Gln Gln
                485                   490                   495
Ala Val Ser Glu Glu Ile Tyr Cys Arg Leu Phe Asp His Val Lys Thr
            500                   505                   510
Gly Ile Glu Asp Val Cys Gly His Trp Gly His Asn Phe Trp Arg Asp
        515                   520                   525
Lys Phe Lys Lys Phe Asp Asp Lys Tyr Leu Arg Lys Leu Leu Ile Arg
    530                   535                   540
Glu Asn Gln Pro Lys Ser Ser Ile Val Ser Leu Tyr Lys Lys Leu Glu
545                   550                   555                   560
Ile Lys His Ala Ile Glu Met Ala Glu Thr Gly Met Ile Ser Thr Val
                565                   570                   575
Pro Thr Phe Ala Ser Leu Asn Asp Cys Arg Glu Glu Lys Ile Arg Lys
            580                   585                   590
Val Thr Ser Ser Glu Thr Asp Glu Ile Arg Glu Leu Leu Ser Arg Asn
        595                   600                   605
Leu Tyr Gln Ile Arg Gln Arg Thr Leu Ser Tyr Asn Arg His Ser Leu
    610                   615                   620
Thr Ala Asp Thr Ser Glu Arg Gln Ala Lys Glu Ile Leu Ile Arg Arg
625                   630                   635                   640
Arg His Ser Leu Arg Glu Ser Ile Arg Lys Asp Ser Ser Leu Asn Arg
            645                   650                   655
```

Page 51

```
Glu His Arg Ala Ser Thr Ser Thr Ser Arg Tyr Leu Ser Leu Pro Lys
             660                 665                 670
Asn Thr Lys Leu Pro Glu Lys Leu Gln Lys Arg Arg Thr Ile Ser Ile
             675             680                 685
Ala Asp Gly Asn Ser Ser Asp Ser Asp Ala Asp Ala Gly Thr Thr Val
             690             695                 700
Leu Asn Leu Gln Pro Arg Ala Arg Arg Phe Leu Pro Glu Gln Phe Ser
705                 710                 715                     720
Lys Lys Ser Pro Gln Ser Tyr Lys Met Glu Trp Lys Asn Glu Val Asp
                 725                 730                 735
Val Asp Ser Gly Arg Asp Met Pro Ser Thr Pro Pro Thr Pro His Ser
             740                 745                 750
Arg Glu Lys Gly Thr Gln Thr Ser Gly Leu Leu Gln Gln Pro Leu Leu
             755                 760                 765
Ser Lys Asp Gln Ser Gly Ser Glu Arg Glu Asp Ser Leu Thr Glu Gly
             770                 775                 780
Ile Pro Pro Lys Pro Pro Pro Arg Leu Val Trp Arg Ala Ser Glu Pro
785                 790                 795                     800
Gly Ser Arg Lys Ala Arg Phe Gly Ser Glu Lys Pro
                 805                 810
```

```
<210>  176
<211>  1164
<212>  PRT
<213>  Human

<400>  176
```

```
Met Pro Thr Met Arg Arg Thr Val Ser Glu Ile Arg Ser Arg Ala Glu
1               5                   10                  15
Gly Tyr Glu Lys Thr Asp Asp Val Ser Glu Lys Thr Ser Leu Ala Asp
             20                  25                  30
Gln Glu Glu Val Arg Thr Ile Phe Ile Asn Gln Pro Gln Leu Thr Lys
             35                  40                  45
Phe Cys Asn Asn His Val Ser Thr Ala Lys Tyr Asn Ile Ile Thr Phe
             50                  55                  60
Leu Pro Arg Phe Leu Tyr Ser Gln Phe Arg Arg Ala Ala Asn Ser Phe
65                  70                  75                      80
Phe Leu Phe Ile Ala Leu Leu Gln Gln Ile Pro Asp Val Ser Pro Thr
                 85                  90                  95
Gly Arg Tyr Thr Thr Leu Val Pro Leu Leu Phe Ile Leu Ala Val Ala
                 100                 105                 110
Ala Ile Lys Glu Ile Ile Glu Asp Ile Lys Arg His Lys Ala Asp Asn
             115                 120                 125
Ala Val Asn Lys Lys Gln Thr Gln Val Leu Arg Asn Gly Ala Trp Glu
             130                 135                 140
Ile Val His Trp Glu Lys Val Ala Val Gly Glu Ile Val Lys Val Thr
145                 150                 155                     160
Asn Gly Glu His Leu Pro Ala Asp Leu Ile Ser Leu Ser Ser Ser Glu
                 165                 170                 175
Pro Gln Ala Met Cys Tyr Ile Glu Thr Ser Asn Leu Asp Gly Glu Thr
                 180                 185                 190
Asn Leu Lys Ile Arg Gln Gly Leu Pro Ala Thr Ser Asp Ile Lys Asp
             195                 200                 205
Val Asp Ser Leu Met Arg Ile Ser Gly Arg Ile Glu Cys Glu Ser Pro
             210                 215                 220
Asn Arg His Leu Tyr Asp Phe Val Gly Asn Ile Arg Leu Asp Gly His
225                 230                 235                     240
Gly Thr Val Pro Leu Gly Ala Asp Gln Ile Leu Leu Arg Gly Ala Gln
                 245                 250                 255
Leu Arg Asn Thr Gln Trp Val His Gly Ile Val Val Tyr Thr Gly His
             260                 265                 270
Asp Thr Lys Leu Met Gln Asn Ser Thr Ser Pro Pro Leu Lys Leu Ser
```

Page 52

```
                275                      280                       285
Asn Val Glu Arg Ile Thr Asn Val Gln Ile Leu Ile Leu Phe Cys Ile
    290                      295                     300
Leu Ile Ala Met Ser Leu Val Cys Ser Val Gly Ser Ala Ile Trp Asn
305                      310                      315                  320
Arg Arg His Ser Gly Lys Asp Trp Tyr Leu Asn Leu Asn Tyr Gly Gly
                325                      330                       335
Ala Ser Asn Phe Gly Leu Asn Phe Leu Thr Phe Ile Ile Leu Phe Asn
            340                      345                   350
Asn Leu Ile Pro Ile Ser Leu Leu Val Thr Leu Glu Val Val Lys Phe
            355                      360                   365
Thr Gln Ala Tyr Phe Ile Asn Trp Asp Leu Asp Met His Tyr Glu Pro
    370                      375                     380
Thr Asp Thr Ala Ala Met Ala Arg Thr Ser Asn Leu Asn Glu Glu Leu
385                      390                      395                  400
Gly Gln Val Lys Tyr Ile Phe Ser Asp Lys Thr Gly Thr Leu Thr Cys
                405                      410                       415
Asn Val Met Gln Phe Lys Lys Cys Thr Ile Ala Gly Val Ala Tyr Gly
            420                      425                   430
His Val Pro Glu Pro Glu Asp Tyr Gly Cys Ser Pro Asp Glu Trp Gln
            435                      440                   445
Asn Ser Gln Phe Gly Asp Glu Lys Thr Phe Ser Asp Ser Ser Leu Leu
    450                      455                     460
Glu Asn Leu Gln Asn Asn His Pro Thr Ala Pro Ile Ile Cys Glu Phe
465                      470                      475                  480
Leu Thr Met Met Ala Val Cys His Thr Ala Val Pro Glu Arg Glu Gly
                485                      490                       495
Asp Lys Ile Ile Tyr Gln Ala Ala Ser Pro Asp Glu Gly Ala Leu Val
            500                      505                   510
Arg Ala Ala Lys Gln Leu Asn Phe Val Phe Thr Gly Arg Thr Pro Asp
            515                      520                   525
Ser Val Ile Ile Asp Ser Leu Gly Gln Glu Glu Arg Tyr Glu Leu Leu
    530                      535                     540
Asn Val Leu Glu Phe Thr Ser Ala Arg Lys Arg Met Ser Val Ile Val
545                      550                      555                  560
Arg Thr Pro Ser Gly Lys Leu Arg Leu Tyr Cys Lys Gly Ala Asp Thr
                565                      570                       575
Val Ile Tyr Asp Arg Leu Ala Glu Thr Ser Lys Tyr Lys Glu Ile Thr
            580                      585                   590
Leu Lys His Leu Glu Gln Phe Ala Thr Glu Gly Leu Arg Thr Leu Cys
    595                      600                     605
Phe Ala Val Ala Glu Ile Ser Glu Ser Asp Phe Gln Glu Trp Arg Ala
    610                      615                     620
Val Tyr Gln Arg Ala Ser Thr Ser Val Gln Asn Arg Leu Leu Lys Leu
625                      630                      635                  640
Glu Glu Ser Tyr Glu Leu Ile Glu Lys Asn Leu Gln Leu Leu Gly Ala
                645                      650                       655
Thr Ala Ile Glu Asp Lys Leu Gln Asp Gln Val Pro Glu Thr Ile Glu
            660                      665                   670
Thr Leu Met Lys Ala Asp Ile Lys Ile Trp Ile Leu Thr Gly Asp Lys
            675                      680                   685
Gln Glu Thr Ala Ile Asn Ile Gly His Ser Cys Lys Leu Leu Lys Lys
    690                      695                     700
Asn Met Gly Met Ile Val Ile Asn Glu Gly Ser Leu Asp Gly Thr Arg
705                      710                      715                  720
Glu Thr Leu Ser Arg His Cys Thr Thr Leu Gly Asp Ala Leu Arg Lys
                725                      730                       735
Glu Asn Asp Phe Ala Leu Ile Ile Asp Gly Lys Thr Leu Lys Tyr Ala
            740                      745                   750
Leu Thr Phe Gly Val Arg Gln Tyr Phe Leu Asp Leu Ala Leu Ser Cys
    755                      760                     765
Lys Ala Val Ile Cys Cys Arg Val Ser Pro Leu Gln Lys Ser Glu Val
    770                      775                     780
```

```
Val Glu Met Val Lys Lys Gln Val Lys Val Val Thr Leu Ala Ile Gly
785             790             795             800
Asp Gly Ala Asn Asp Val Ser Met Ile Gln Thr Ala His Val Gly Val
            805             810             815
Gly Ile Ser Gly Asn Glu Gly Leu Gln Ala Ala Asn Ser Ser Asp Tyr
            820             825             830
Ser Ile Ala Gln Phe Lys Tyr Leu Lys Asn Leu Leu Met Ile His Gly
        835             840             845
Ala Trp Asn Tyr Asn Arg Val Ser Lys Cys Ile Leu Tyr Cys Phe Tyr
        850             855             860
Lys Asn Ile Val Leu Tyr Ile Ile Glu Ile Trp Phe Ala Phe Val Asn
865             870             875             880
Gly Phe Ser Gly Gln Ile Leu Phe Glu Arg Trp Cys Ile Gly Leu Tyr
            885             890             895
Asn Val Met Phe Thr Ala Met Pro Pro Leu Thr Leu Gly Ile Phe Glu
            900             905             910
Arg Ser Cys Arg Lys Glu Asn Met Leu Lys Tyr Pro Glu Leu Tyr Lys
            915             920             925
Thr Ser Gln Asn Ala Leu Asp Phe Asn Thr Lys Val Phe Trp Val His
        930             935             940
Cys Leu Asn Gly Leu Phe His Ser Val Ile Leu Phe Trp Phe Pro Leu
945             950             955             960
Lys Ala Leu Gln Tyr Gly Thr Ala Phe Gly Asn Gly Lys Thr Ser Asp
            965             970             975
Tyr Leu Leu Leu Gly Asn Phe Val Tyr Thr Phe Val Val Ile Thr Val
            980             985             990
Cys Leu Lys Ala Gly Leu Glu Thr Ser Tyr Trp Thr Trp Phe Ser His
        995             1000            1005
Ile Ala Ile Trp Gly Ser Ile Ala Leu Trp Val Val Phe Phe Gly
    1010            1015            1020
Ile Tyr Ser Ser Leu Trp Pro Ala Ile Pro Met Ala Pro Asp Met
    1025            1030            1035
Ser Gly Glu Ala Ala Met Leu Phe Ser Ser Gly Val Phe Trp Met
    1040            1045            1050
Gly Leu Leu Phe Ile Pro Val Ala Ser Leu Leu Leu Asp Val Val
    1055            1060            1065
Tyr Lys Val Ile Lys Arg Thr Ala Phe Lys Thr Leu Val Asp Glu
    1070            1075            1080
Val Gln Glu Leu Glu Ala Lys Ser Gln Asp Pro Gly Ala Val Val
    1085            1090            1095
Leu Gly Lys Ser Leu Thr Glu Arg Ala Gln Leu Leu Lys Asn Val
    1100            1105            1110
Phe Lys Lys Asn His Val Asn Leu Tyr Arg Ser Glu Ser Leu Gln
    1115            1120            1125
Gln Asn Leu Leu His Gly Tyr Ala Phe Ser Gln Asp Glu Asn Gly
    1130            1135            1140
Ile Val Ser Gln Ser Glu Val Ile Arg Ala Tyr Asp Thr Thr Lys
    1145            1150            1155
Gln Arg Pro Asp Glu Trp
    1160
```

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<210>  177
<211>  1148
<212>  PRT
<213>  Mouse

<400>  177
```

```
Met Ser Arg Ala Thr Ser Val Gly Asp Gln Leu Glu Ala Pro Ala Arg
1               5               10              15
Ile Ile Tyr Leu Asn Gln Ser His Leu Asn Lys Phe Cys Asp Asn Arg
            20              25              30
Ile Ser Thr Ala Lys Tyr Ser Val Leu Thr Phe Leu Pro Arg Phe Leu
```

```
                35                        40                        45
Tyr Glu Gln Ile Arg Arg Ala Ala Asn Ala Phe Phe Leu Phe Ile Ala
    50                        55                        60
Leu Leu Gln Gln Ile Pro Asp Val Ser Pro Thr Gly Arg Tyr Thr Thr
65                        70                        75                        80
Leu Val Pro Leu Val Ile Ile Leu Thr Ile Ala Gly Ile Lys Glu Ile
                85                        90                        95
Ile Glu Asp Phe Lys Arg His Lys Ala Asp Asn Ala Val Asn Lys Lys
                100                       105                       110
Lys Thr Ile Val Leu Arg Asn Gly Met Trp His Thr Ile Met Trp Lys
        115                       120                       125
Glu Val Ala Val Gly Asp Ile Val Lys Val Leu Asn Gly Gln Tyr Leu
        130                       135                       140
Pro Ala Asp Met Val Leu Phe Ser Ser Glu Pro Gln Gly Met Cys
145                       150                       155                       160
Tyr Val Glu Thr Ala Asn Leu Asp Gly Glu Thr Asn Leu Lys Ile Arg
                165                       170                       175
Gln Gly Leu Ser His Thr Thr Asp Met Gln Thr Arg Asp Val Leu Met
                180                       185                       190
Lys Leu Ser Gly Arg Ile Glu Cys Glu Gly Pro Asn Arg His Leu Tyr
        195                       200                       205
Asp Phe Thr Gly Asn Leu His Leu Asp Gly Lys Ser Ser Val Ala Leu
        210                       215                       220
Gly Pro Asp Gln Ile Leu Leu Arg Gly Thr Gln Leu Arg Asn Thr Gln
225                       230                       235                       240
Trp Val Phe Gly Val Val Val Tyr Thr Gly His Asp Ser Lys Leu Met
                245                       250                       255
Gln Asn Ser Thr Lys Ala Pro Leu Lys Arg Ser Asn Val Glu Lys Val
                260                       265                       270
Thr Asn Val Gln Ile Leu Val Leu Phe Gly Ile Leu Leu Val Met Ala
        275                       280                       285
Leu Val Ser Ser Val Gly Ala Leu Phe Trp Asn Gly Ser His Gly Gly
        290                       295                       300
Lys Ser Trp Tyr Ile Lys Lys Met Asp Thr Asn Ser Asp Asn Phe Gly
305                       310                       315                       320
Tyr Asn Leu Leu Thr Phe Ile Ile Leu Tyr Asn Asn Leu Ile Pro Ile
                325                       330                       335
Ser Leu Leu Val Thr Leu Glu Val Val Lys Tyr Thr Gln Ala Leu Phe
                340                       345                       350
Ile Asn Trp Asp Met Asp Met Tyr Tyr Ile Glu Asn Asp Thr Pro Ala
        355                       360                       365
Met Ala Arg Thr Ser Asn Leu Asn Glu Glu Leu Gly Gln Val Lys Tyr
        370                       375                       380
Leu Phe Ser Asp Lys Thr Gly Thr Leu Thr Cys Asn Ile Met Asn Phe
385                       390                       395                       400
Lys Lys Cys Ser Ile Ala Gly Val Thr Tyr Gly His Phe Pro Glu Leu
                405                       410                       415
Ala Arg Glu Gln Ser Ser Asp Asp Phe Cys Arg Met Thr Ser Cys Thr
        420                       425                       430
Asn Asp Ser Cys Asp Phe Asn Asp Pro Arg Leu Leu Lys Asn Ile Glu
        435                       440                       445
Asp Gln His Pro Thr Ala Pro Cys Ile Gln Glu Phe Leu Thr Leu Leu
        450                       455                       460
Ala Val Cys His Thr Val Val Pro Glu Lys Asp Gly Asp Glu Ile Ile
465                       470                       475                       480
Tyr Gln Ala Ser Ser Pro Asp Glu Ala Ala Leu Val Lys Gly Ala Lys
                485                       490                       495
Lys Leu Gly Phe Val Phe Thr Gly Arg Thr Pro Tyr Ser Val Ile Ile
                500                       505                       510
Glu Ala Met Gly Gln Glu Gln Thr Phe Gly Ile Leu Asn Val Leu Glu
        515                       520                       525
Phe Ser Ser Asp Arg Lys Arg Met Ser Val Ile Val Arg Leu Pro Ser
        530                       535                       540
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Gly Gln Leu Arg Leu Tyr Cys Lys Gly Ala Asp Asn Val Ile Phe Glu
545                 550                 555                 560
Arg Leu Ser Lys Asp Ser Lys Tyr Met Glu Glu Thr Leu Cys His Leu
                565                 570                 575
Glu Tyr Phe Ala Thr Glu Gly Leu Arg Thr Leu Cys Val Ala Tyr Ala
                580                 585                 590
Asp Leu Ser Glu Asn Glu Tyr Glu Glu Trp Leu Lys Val Tyr Gln Glu
                595                 600                 605
Ala Ser Ile Ile Leu Lys Asp Arg Ala Gln Arg Leu Glu Glu Cys Tyr
        610                 615                 620
Glu Ile Ile Glu Lys Asn Leu Leu Leu Gly Ala Thr Ala Ile Glu
625                 630                 635                 640
Asp Arg Leu Gln Ala Gly Val Pro Glu Thr Ile Ala Thr Leu Leu Lys
                645                 650                 655
Ala Glu Ile Lys Ile Trp Val Leu Thr Gly Asp Lys Gln Glu Thr Ala
                660                 665                 670
Ile Asn Ile Gly Tyr Ser Cys Arg Leu Val Ser Gln Asn Met Ala Leu
        675                 680                 685
Ile Leu Leu Lys Glu Asp Ser Leu Asp Ala Thr Arg Ala Ala Ile Thr
        690                 695                 700
Gln His Cys Thr Asp Leu Gly Asn Leu Leu Gly Lys Glu Asn Asp Val
705                 710                 715                 720
Ala Leu Ile Ile Asp Gly His Thr Leu Lys Tyr Ala Leu Ser Phe Glu
                725                 730                 735
Val Arg Arg Ser Phe Leu Asp Leu Ala Leu Ser Cys Lys Ala Val Ile
                740                 745                 750
Cys Cys Arg Val Ser Pro Leu Gln Lys Ser Glu Ile Val Asp Val Val
        755                 760                 765
Lys Lys Arg Val Lys Ala Ile Thr Leu Ala Ile Gly Asp Gly Ala Asn
        770                 775                 780
Asp Val Gly Met Ile Gln Thr Ala His Val Gly Val Gly Ile Ser Gly
785                 790                 795                 800
Asn Glu Gly Met Gln Ala Thr Asn Asn Ser Asp Tyr Ala Ile Ala Gln
                805                 810                 815
Phe Ser Tyr Leu Glu Lys Leu Leu Leu Val His Gly Ala Trp Ser Tyr
                820                 825                 830
Asn Arg Val Thr Lys Cys Ile Leu Tyr Cys Phe Tyr Lys Asn Val Val
        835                 840                 845
Leu Tyr Ile Ile Glu Leu Trp Phe Ala Phe Val Asn Gly Phe Ser Gly
        850                 855                 860
Gln Ile Leu Phe Glu Arg Trp Cys Ile Gly Leu Tyr Asn Val Ile Phe
865                 870                 875                 880
Thr Ala Leu Pro Pro Phe Thr Leu Gly Ile Phe Glu Arg Ser Cys Thr
                885                 890                 895
Gln Glu Ser Met Leu Arg Phe Pro Gln Leu Tyr Arg Ile Thr Gln Asn
                900                 905                 910
Ala Glu Gly Phe Asn Thr Lys Val Phe Trp Gly His Cys Ile Asn Ala
        915                 920                 925
Leu Val His Ser Leu Ile Leu Phe Trp Val Pro Met Lys Ala Leu Glu
        930                 935                 940
His Asp Thr Pro Val Thr Ser Gly His Ala Thr Asp Tyr Leu Phe Val
945                 950                 955                 960
Gly Asn Ile Val Tyr Thr Tyr Val Val Val Thr Val Cys Leu Lys Ala
                965                 970                 975
Gly Leu Glu Thr Thr Ala Trp Thr Lys Phe Ser His Leu Ala Val Trp
                980                 985                 990
Gly Ser Met Leu Ile Trp Leu Val  Phe Phe Gly Val Tyr  Ser Thr Ile
        995                 1000                 1005
Trp Pro  Thr Ile Pro Ile Ala  Pro Asp Met Lys Gly  Gln Ala Thr
    1010                 1015                 1020
Met Val  Leu Ser Ser Ala Tyr  Phe Trp Leu Gly Leu  Phe Leu Val
    1025                 1030                 1035
Pro Thr  Ala Cys Leu Ile Glu  Asp Val Ala Trp Arg  Ala Ala Lys
```

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      1040                    1045                    1050
His Thr  Cys Lys Lys Thr Leu  Leu Glu Glu Val Gln  Glu Leu Glu
      1055                    1060                    1065
Thr Lys  Ser Arg Val Met Gly  Lys Ala Met Leu Arg  Asp Ser Asn
      1070                    1075                    1080
Gly Lys  Arg Met Asn Glu Arg  Asp Arg Leu Ile Lys  Arg Leu Ser
      1085                    1090                    1095
Arg Lys  Thr Pro Pro Thr Leu  Phe Arg Thr Gly Ser  Ile Gln Gln
      1100                    1105                    1110
Cys Val  Ser His Gly Tyr Ala  Phe Ser Gln Glu Glu  His Gly Ala
      1115                    1120                    1125
Val Thr  Gln Glu Glu Ile Val  Arg Ala Tyr Asp Thr  Thr Lys Glu
      1130                    1135                    1140
Asn Ser  Arg Lys Lys
      1145
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<210>   178
<211>   839
<212>   PRT
<213>   Human
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<400>   178
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Met Lys Lys Trp Ser Ser Thr Asp Leu Gly Ala Ala Ala Asp Pro Leu
1               5                   10                  15
Gln Lys Asp Thr Cys Pro Asp Pro Leu Asp Gly Asp Pro Asn Ser Arg
              20                  25                  30
Pro Pro Pro Ala Lys Pro Gln Leu Ser Thr Ala Lys Ser Arg Thr Arg
          35                  40                  45
Leu Phe Gly Lys Gly Asp Ser Glu Glu Ala Phe Pro Val Asp Cys Pro
      50                  55                  60
His Glu Glu Gly Glu Leu Asp Ser Cys Pro Thr Ile Thr Val Ser Pro
65                  70                  75                  80
Val Ile Thr Ile Gln Arg Pro Gly Asp Gly Pro Thr Gly Ala Arg Leu
                  85                  90                  95
Leu Ser Gln Asp Ser Val Ala Ala Ser Thr Glu Lys Thr Leu Arg Leu
              100                 105                 110
Tyr Asp Arg Arg Ser Ile Phe Glu Ala Val Ala Gln Asn Asn Cys Gln
          115                 120                 125
Asp Leu Glu Ser Leu Leu Leu Phe Leu Gln Lys Ser Lys Lys His Leu
      130                 135                 140
Thr Asp Asn Glu Phe Lys Asp Pro Glu Thr Gly Lys Thr Cys Leu Leu
145                 150                 155                 160
Lys Ala Met Leu Asn Leu His Asp Gly Gln Asn Thr Thr Ile Pro Leu
                  165                 170                 175
Leu Leu Glu Ile Ala Arg Gln Thr Asp Ser Leu Lys Glu Leu Val Asn
              180                 185                 190
Ala Ser Tyr Thr Asp Ser Tyr Tyr Lys Gly Gln Thr Ala Leu His Ile
          195                 200                 205
Ala Ile Glu Arg Arg Asn Met Ala Leu Val Thr Leu Leu Val Glu Asn
      210                 215                 220
Gly Ala Asp Val Gln Ala Ala Ala His Gly Asp Phe Phe Lys Lys Thr
225                 230                 235                 240
Lys Gly Arg Pro Gly Phe Tyr Phe Gly Glu Leu Pro Leu Ser Leu Ala
                  245                 250                 255
Ala Cys Thr Asn Gln Leu Gly Ile Val Lys Phe Leu Leu Gln Asn Ser
              260                 265                 270
Trp Gln Thr Ala Asp Ile Ser Ala Arg Asp Ser Val Gly Asn Thr Val
          275                 280                 285
Leu His Ala Leu Val Glu Val Ala Asp Asn Thr Ala Asp Asn Thr Lys
      290                 295                 300
Phe Val Thr Ser Met Tyr Asn Glu Ile Leu Met Leu Gly Ala Lys Leu
305                 310                 315                 320
```

His Pro Thr Leu Lys Leu Glu Glu Leu Thr Asn Lys Lys Gly Met Thr
                325   330   335
Pro Leu Ala Leu Ala Ala Gly Thr Gly Lys Ile Gly Val Leu Ala Tyr
                340   345   350
Ile Leu Gln Arg Glu Ile Gln Glu Pro Glu Cys Arg His Leu Ser Arg
                355   360   365
Lys Phe Thr Glu Trp Ala Tyr Gly Pro Val His Ser Ser Leu Tyr Asp
                370   375   380
Leu Ser Cys Ile Asp Thr Cys Glu Lys Asn Ser Val Leu Glu Val Ile
385   390   395   400
Ala Tyr Ser Ser Ser Glu Thr Pro Asn Arg His Asp Met Leu Leu Val
                405   410   415
Glu Pro Leu Asn Arg Leu Leu Gln Asp Lys Trp Asp Arg Phe Val Lys
                420   425   430
Arg Ile Phe Tyr Phe Asn Phe Leu Val Tyr Cys Leu Tyr Met Ile Ile
                435   440   445
Phe Thr Met Ala Ala Tyr Tyr Arg Pro Val Asp Gly Leu Pro Pro Phe
                450   455   460
Lys Met Glu Lys Thr Gly Asp Tyr Phe Arg Val Thr Gly Glu Ile Leu
465   470   475   480
Ser Val Leu Gly Gly Val Tyr Phe Phe Phe Arg Gly Ile Gln Tyr Phe
                485   490   495
Leu Gln Arg Arg Pro Ser Met Lys Thr Leu Phe Val Asp Ser Tyr Ser
                500   505   510
Glu Met Leu Phe Phe Leu Gln Ser Leu Phe Met Leu Ala Thr Val Val
                515   520   525
Leu Tyr Phe Ser His Leu Lys Glu Tyr Val Ala Ser Met Val Phe Ser
                530   535   540
Leu Ala Leu Gly Trp Thr Asn Met Leu Tyr Tyr Thr Arg Gly Phe Gln
545   550   555   560
Gln Met Gly Ile Tyr Ala Val Met Ile Glu Lys Met Ile Leu Arg Asp
                565   570   575
Leu Cys Arg Phe Met Phe Val Tyr Ile Val Phe Leu Phe Gly Phe Ser
                580   585   590
Thr Ala Val Val Thr Leu Ile Glu Asp Gly Lys Asn Asp Ser Leu Pro
                595   600   605
Ser Glu Ser Thr Ser His Arg Trp Arg Gly Pro Ala Cys Arg Pro Pro
610   615   620
Asp Ser Ser Tyr Asn Ser Leu Tyr Ser Thr Cys Leu Glu Leu Phe Lys
625   630   635   640
Phe Thr Ile Gly Met Gly Asp Leu Glu Phe Thr Glu Asn Tyr Asp Phe
                645   650   655
Lys Ala Val Phe Ile Ile Leu Leu Leu Ala Tyr Val Ile Leu Thr Tyr
                660   665   670
Ile Leu Leu Leu Asn Met Leu Ile Ala Leu Met Gly Glu Thr Val Asn
                675   680   685
Lys Ile Ala Gln Glu Ser Lys Asn Ile Trp Lys Leu Gln Arg Ala Ile
                690   695   700
Thr Ile Leu Asp Thr Glu Lys Ser Phe Leu Lys Cys Met Arg Lys Ala
705   710   715   720
Phe Arg Ser Gly Lys Leu Leu Gln Val Gly Tyr Thr Pro Asp Gly Lys
                725   730   735
Asp Asp Tyr Arg Trp Cys Phe Arg Val Asp Glu Val Asn Trp Thr Thr
                740   745   750
Trp Asn Thr Asn Val Gly Ile Ile Asn Glu Asp Pro Gly Asn Cys Glu
                755   760   765
Gly Val Lys Arg Thr Leu Ser Phe Ser Leu Arg Ser Ser Arg Val Ser
                770   775   780
Gly Arg His Trp Lys Asn Phe Ala Leu Val Pro Leu Leu Arg Glu Ala
785   790   795   800
Ser Ala Arg Asp Arg Gln Ser Ala Gln Pro Glu Glu Val Tyr Leu Arg
                805   810   815
Gln Phe Ser Gly Ser Leu Lys Pro Glu Asp Ala Glu Val Phe Lys Ser

820   825   830

Pro Ala Ala Ser Gly Glu Lys
       835